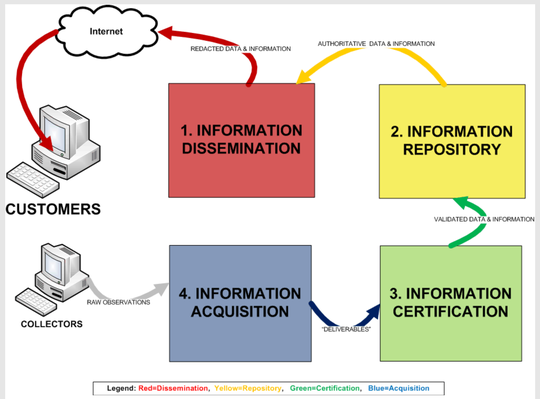
Designing Vital Signs Protocols Based in Data Management

Bill Johnson

Data Manager, Southeast Alaska Network

Data Design



Design runs clockwise 1-2-3-4. Operations runs counterclockwise 4-3-2-1.

Design Order Should be the Opposite of Operational Order

1. Identify all the final products that will be created by the program.
2. Define in detail the data objects required to support those deliverables.
3. Lay out the procedures needed to create ,validate, and maintain the deliverables.
4. Determine precisely what data to collect and how to accomplish it.

Program or Project?

proj·ect [proj-ekt, -ikt] –noun
3. a specific task of investigation, esp. in scholarship

pro·gram [proh-gram, -gruhm] –noun
6. a planned, coordinated group of activities, procedures, etc., often for a specific purpose, or a facility offering such a series of activities

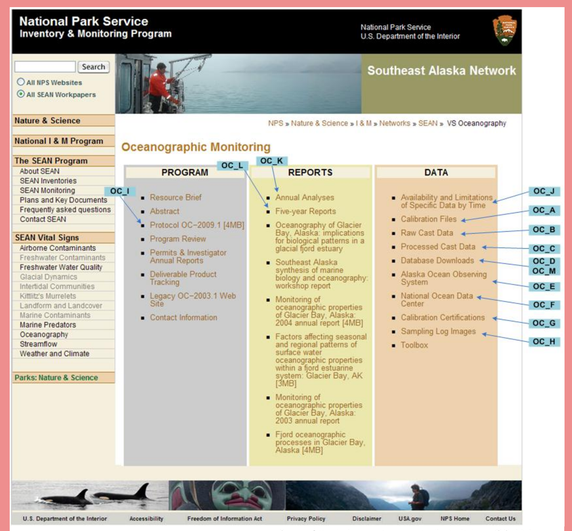
Source: http://dictionary.reference.com accessed April 12, 2010

1. A project is centered on a specific task of investigation, often having a finite duration.
2. A program consists of a group of activities designed to run on a continuous basis.
3. To be successful, monitoring programs need consistency so their products are comparable over time.
4. To achieve consistency it is necessary to design a program before executing it.

1. Dissemination

Deliverable Title	Description	Provided to Customers as	Frequency Produced	Responsibility	SOP
OC_G: Calibration certificates	Scanned images of certificates provided by instrument servicers that document sensor sensitivity factors at the time of each calibration.	Individual PDF files, one for each certificate.	Typically, one per year per sensor after the annual instrument calibration has been performed. May be done more frequently if an individual sensor is recalibrated due to its being repaired or replaced.	Project Leader	2
OC_H: Field log sheets	Two-sided color scans of the original field log sheets	One PDF file containing one November – October year.	Once per year.	Project Leader	12
OC_I: Protocol	This protocol document, explaining the complete details of the monitoring program as currently implemented.	One PDF file.	As required.	Network Coordinator	18
OC_J: Data availability matrix	Data availability matrix documenting which data are available in the OC_D database by month and year.	One cumulative PDF file covering all years.	Typically once per year after certification of the latest OC_D.	Data Manager	13
OC_K: Annual data report	Annual report summarizing operations and data.	One PDF file.	Once per year after certification of the corresponding OC_D.	Project Leader	14
OC_L: Five-year report	Five-year analysis reviewing trends in the collected parameters	One PDF file.	Once every fifth year after completion of the most recent OC_K annual report.	Ecologist	15
OC_M: Data quality assignment	Data quality adjustment report used to flag database rows judged to be anomalous for various reasons.	Incorporated into the OC_D downloadable database.	Once per year after certification of the latest OC_D.	Project Leader	11

Job 1: Identify all Data Deliverables to be Provided by the Program



Source: http://science.nature.nps.gov/im/units/sean/OC_Main.aspx

Then Determine the Dissemination Sites to Use to Serve Out These Deliverables

2. Repository

J.3 OC_C: Processed CNV Files

Purpose of deliverable: CNV files show the recorded parameters for each cast in a manner useful for analysis. Each CNV is derived from a HEX file, but differs in three ways. First, the CNV data shows one row for every meter of depth; while HEX data typically show multiple rows for every meter, as HEX readings are taken at periodic times instead of periodic depths. Second, CNV values have been normalized using the calibration factors. Third, CNV values are in terms of engineering units instead of voltage/frequency levels.

Frequency produced: OC_C is created at the end of each season by generating a CNV file for each HEX file and then packaging all CNV files into a single deliverable.

Prerequisites: Production of this deliverable is dependent on having certified OC_A and OC_B products for the season.

Data flow:

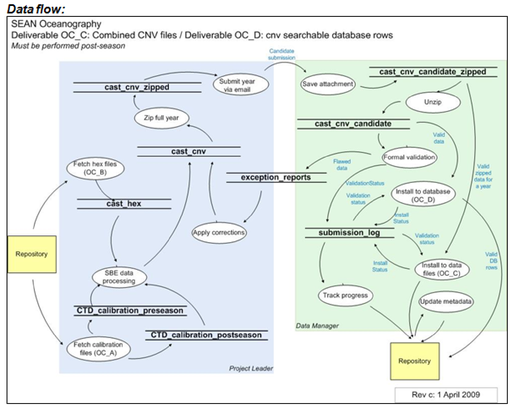


Figure J.3. Data flow required to generate deliverable OC_C – CNV files.

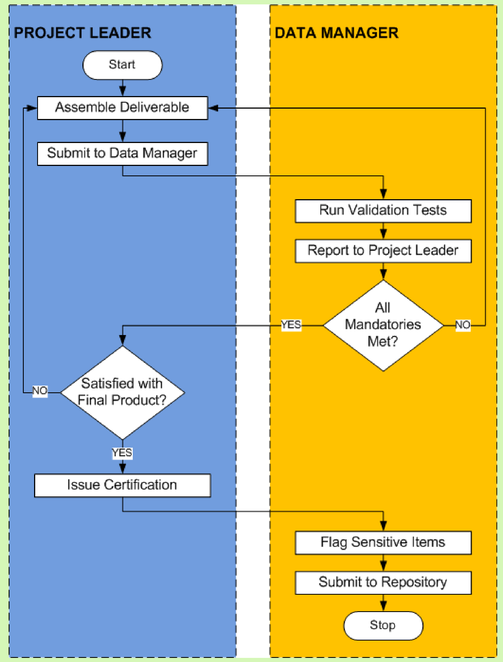
Form Y: Attribute Definition

Vital Sign: OC Oceanography	*Attribute identifier:* OXYGEN	*Used by deliverable ID:* OC_C
Revision date / protocol version: 04-09-2009 / 2009.1	*Default report heading:* Dissolved Oxygen (ml/l)	*Relation (from Form X):* yymm_C_dddd_cc.cnv
Purpose: Dissolved oxygen content.		

Data type:	real
Maximum length	6
Required:	no
Measurement units:	ml/l
Format:	99.999
Foreign key to (relation+attribute):	n/a
Case:	n/a
Mandatory validation rules for this attribute (in order of application):	1. Must be a real number. 2. Must be between 0.0 and 20.0. 3. Special allowed case of SBE error flag value: -9.990e-29.
Optional validation rules for this attribute:	• Should be between 2.0 and 14.0.

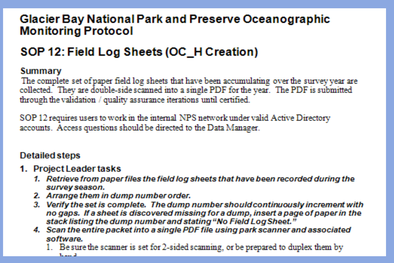
Next Specify in Detail the Data Deliverables – This Results in Database Objects and Validation Rules

3. Certification



1. Validation criteria must be explicitly documented in advance in the data deliverable specifications.
2. To assure accountability, the Project Leader tasks and Data Manager tasks must be clearly distinguished.
3. Each deliverable submission by the Project Leader should be assigned a unique one-time ID; a database tracks the outcome of each submission using ID as the primary key.

4. Acquisition



Glacier Bay National Park and Preserve Oceanographic Monitoring Protocol

SOP 12: Field Log Sheets (OC_H Creation)

Summary

The complete set of paper field log sheets that have been accumulating over the survey year are collected. They are double-side scanned into a single PDF for the year. The PDF is submitted through the validation / quality assurance iterations until certified.

SOP 12 requires users to work in the internal NPS network under valid Active Directory accounts. Access questions should be directed to the Data Manager.

Detailed steps

1. **Project Leader tasks**
   1. ***Retrieve from paper files the field log sheets that have been recorded during the survey season.***
   2. ***Arrange them in dump number order.***
   3. ***Verify the set is complete. The dump number should continuously increment with no gaps. If a sheet is discovered missing for a dump, insert a page of paper in the stack listing the dump number and stating "No Field Log Sheet."***
   4. ***Scan the entire packet into a single PDF file using park scanner and associated software.***
      1. Be sure the scanner is set for 2-sided scanning, or be prepared to duplex them by

Now Write the SOPs

Example of this approach in practice:

http://science.nature.nps.gov/im/units/sean/OC_Main.aspx

or Google “SEAN Oceanography”